REMARKS

This application has been carefully reviewed in light of the Office Action dated January 16, 2004 (Paper No. 7). Claims 1, 17, 34 to 52, 56, 60, 64, 68 and 78 to 84 are presented for examination, of which Claims 1, 17, 34, 35, 48, 52, 56, 60, 64, 68, 78 and 84 are independent. Reconsideration and further examination are respectfully requested.

Initially, the Examiner's attention is drawn to the accompanying Information Disclosure Statement. It is respectfully requested that the information contained therein be considered by the Examiner and that a copy of the enclosed Form PTO-1449 be returned indicating that such information has been considered.

As to a formal matter, Claim 73 was objected to over informalities. Claim 73 has been cancelled, and this objection is now considered moot. Removal the objection is respectfully requested.

Claims 1 to 3, 5 to 8, 14, 15, 17 to 19, 21 to 24, 30, 31, 33 to 37, 39 to 42, 48 to 58, 60 to 70 and 72 to 77 were rejected under 35 U.S.C. § 102(b) over U.S. Patent No. 5,696,604 (Curry). Claim 4, 12, 13, 20, 28, 29, 38, 46 and 47 were rejected under 35 U.S.C. § 103(a) over Curry in view of U.S. Patent No. 5,341,228 (Parker). Claims 9, 24 and 43 were rejected under 35 U.S.C. § 103(a) over Curry in view of U.S. Patent No. 5,801,845 (Hayashi). Claims 10, 11, 26, 27, 44 and 45 were rejected under 35 U.S.C. § 103(a) over Curry in view of U.S. Patent No. 5,528,387 (Kelly). Claims 16, 32, 59 and 71 were rejected under 35 U.S.C. § 103(a) Curry in view of U.S. Patent No. 5,982,992 (Slade). Claims 78 to 80, 82, 84 to 86 and 88 were rejected under 35 U.S.C. § 103(a) over Curry in view of U.S. Patent No. 5,799,137 (Broddin). Claims 81, 83, 87 and 89 were

rejected under 35 U.S.C. § 103(a) over Curry in view of Broddin and Slade. Claims 2 to 16, 18 to 33, 53 to 55, 57 to 59, 61 to 63, 65 to 67, 69 to 77 and 85 to 89 have been cancelled without prejudice of disclaimer of subject matter, and without conceding the correctness of the rejections. The remaining rejections are respectfully traversed.

The present invention relates to image recording where the recording is performed using a dot pattern. The image data to be recorded represents each pixel with one of N gradation values, and this data is recording using a dot pattern corresponding to each gradation value. One feature of the present invention lies in the selection of one dot pattern based on position information and gradation-value information of a pixel, from a dot pattern table. The dot pattern tables have a plurality of dot patterns for each gradation value.

For example, Figure 8 depicts a dot pattern table for the gradation value of 1. Each dot pattern in the table is represented by a 2x2 square. Since the table in Figure 8 represent a dot pattern for the gradation value of 1, 1 dot is contained in each 2x2 pattern. However, the placement of the dots in the dot patterns differs based on position within the dot pattern table. In this way, image pixels that have a gradation value of one will be recorded with different dot patterns based on that pixel's position. As another example, Figure 35A depicts a 2x2 dot pattern table with a gradation value of 2. By selecting dot patterns based on position and gradation value from dot pattern tables, the present invention can record images with reduced unevenness due to density and reduced unevenness due to stripes.

With specific reference to the claims, independent Claim 1 recites an image recording method for performing recording using a dot pattern corresponding to each gradation value, based on image data representing each pixel with one of N gradation values. The method comprises an input step for inputting image data including gradation-value information and position information relating to each pixel, a first selection step for selecting one dot-pattern table based on gradation-value information indicated by each pixel of the image data input in the input step, from among N dot-pattern tables, each having a plurality of different dot patterns, corresponding to respective ones of the N gradation values, a second selection step for selecting one dot pattern based on position information indicated by the pixel from the dot-pattern table selected in the first selection step, and a recording step for recording an ink dot based on the dot pattern selected in the second selection step on a recording medium using a recording head.

Independent Claims 17, 34 and 35 correspond generally to independent Claim 1, and each claim recites the feature of selecting one dot-pattern table based on gradation-value information indicated by each pixel of the image data input, from among N dot-pattern tables, each having a plurality of different dot patterns, corresponding to respective ones of the N gradation values, and selecting one dot pattern based on position information indicated by the pixel from the dot-pattern table selected.

The applied art is not seen to disclose or suggest the feature of independent Claims 1, 17, 34 and 35, and in particular, is not seen to disclose or suggest selecting one dot-pattern table based on gradation-value information indicated by each pixel of the image data input, from among N dot-pattern tables, each having a plurality of different dot

patterns, corresponding to respective ones of the N gradation values, and selecting one dot pattern based on position information indicated by the pixel from the dot-pattern table selected.

Curry relates to an analytical halftone dot construction for a hyperacuity printer. Curry is seen to teach the use of a dot area parameter calculator 28 to calculate a set of dot parameters defining the configuration of a halftone dot required to fill an area within a halftone cell, wherein the set of parameters corresponds to an intensity level. Curry teaches that the parameters calculated are radius r and power p for a circle-diamond-circle halftone dot pattern (column 4, lines 57-67). The intensity levels used by Curry are 8-bit values that can range from 0 to 255 (column 5, lines 1-9).

Curry then scans each halftone cell in the x-y coordinate plane with position scanner 34. Measurement processor 30 locates a nearest edge E of the halftone dot for current intensity level defined by the dot parameter calculator, and a halftone dot is printed at the edge E at a screen angle. The screen angle is defined as the angle between the scan direction and the x-coordinate direction (column 5, lines 9-24).

As such, Curry is seen to teach that dot parameters for a range of intensity levels can be calculated for a predetermined dot pattern. Specifically, Curry is seen to teach the use of a circle-diamond-circle halftone pattern (see Figures 5A-5B). Halftone-dots are then printed in a half-tone cell by scanning the cell to find the position at which the halftone dot of the current intensity begins.

Curry is not seen to disclose or suggest selecting one dot-pattern table based on gradation-value information indicated by each pixel of an image data input, from among

N dot-pattern tables, each having a plurality of different dot patterns. While Curry calculates dot parameters at various intensity levels, Curry is not seen in any way to teach that the table created has a plurality of different dot patterns. Specifically, Curry is seen to teach calculating parameters for one pattern, such as radius r and power p for a circle-diamond-circle pattern, for each intensity level (column 4, lines 57-67).

As such, Curry cannot be seen to teach selecting one dot pattern based on position information indicated by the pixel from the dot-pattern table selected. Since Curry is seen to teach one pattern for each intensity level, Curry not be seen to teach that one of a plurality of dot patterns is chosen based on position information indicated by a pixel.

The remaining art applied against the claims, namely Parker, Hayashi, Kelly, Broddin and Slade, is not seen to supply what is missing from Curry. Accordingly, based on the foregoing, independent Claims 1, 17, 34 and 35 are believed to be allowable.

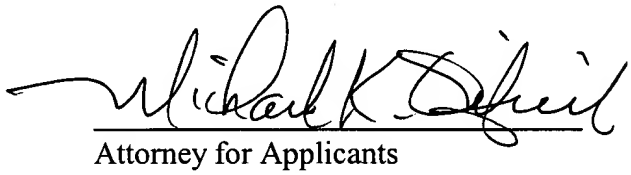
Independent Claims 48, 52, 56, 60, 64, 68, 78 and 84 each also recite the feature of selecting a dot pattern based on gradation and position information from a dot pattern table, wherein each dot pattern table includes a plurality of dot positions. Based on the foregoing remarks, independent Claims 48, 52, 56, 60, 64, 68, 78 and 84 are also believed to be allowable.

The other claims in the application are each dependent from the independent claims and are believed to be allowable over the applied references for at least the same reasons. Because each dependent claim is deemed to define an additional aspect of the invention, however, the individual consideration of each on its own merits is respectfully requested.

No other matters being raised, it is believed that the entire application is fully in condition for allowance, and such action is courteously solicited.

Applicants' undersigned attorney may be reached in our Costa Mesa, California office at (714) 540-8700. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted



Attorney for Applicants

Registration No. 32622

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York 10112-2200
Facsimile: (212) 218-2200

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